The Scientific methodS

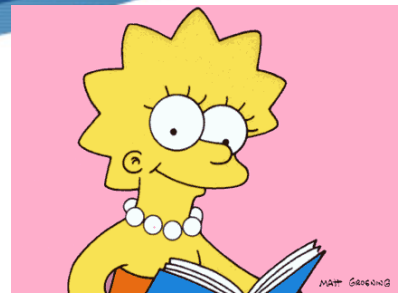
Steps or a process?

Two Types of Reasoning

Induction

and

Deduction



Induction

- moving from the specific to the general
- arguments based on experience or observation are best expressed inductively

Deduction

- begins with the general and ends with the specific
- arguments based on laws, rules, or other widely accepted principles are best expressed deductively.

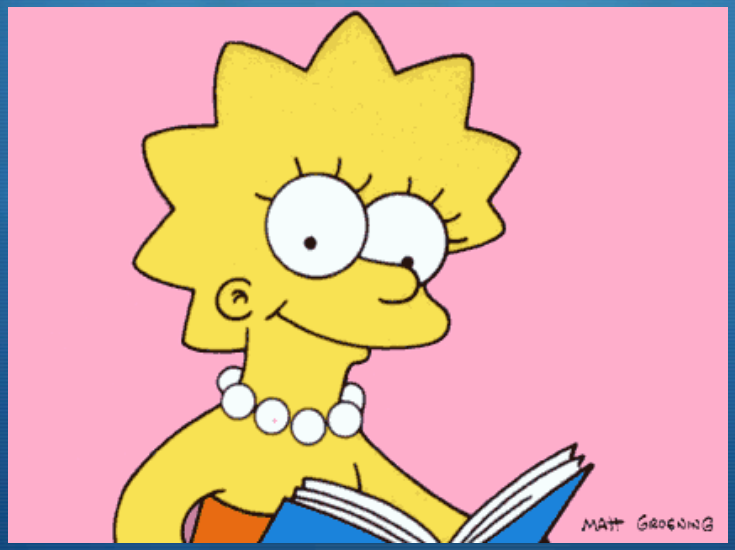
Consider the following example:

- **Bart**: I've noticed previously that every time I kick a ball up, it comes back down, so I guess this next time when I kick it up, it will come back down, too.
- **Lisa**: That's Newton's Law. Everything that goes up must come down. And so, if you kick the ball up, it must come down.

Answer

- Bart is using inductive reasoning, arguing from observation, while Lisa is using deductive reasoning, arguing from the law of gravity.

Lisa's argument is clearly from the general (the law of gravity) to the specific (this kick)



Bart's argument may be less obviously from the specific to the general because he has stated it in terms **only of the next similar event**--the next time he kicks the ball.

The difference between inductive and deductive reasoning is mostly in the way the arguments are expressed. Any inductive argument can also be expressed deductively, and any deductive argument can also be expressed inductively.

Bart's inductive argument is supported by his previous observations, while Lisa's deductive argument is supported by her reference to the law of gravity.

So therefore

- Can Bart could provide additional support for his inductive reasoning?
- Can Lisa?

Thus, Bart could provide additional support by detailing those observations, without any recourse to books or theories of physics
Lisa could provide additional support by discussing Newton's law, even if Lisa herself had never seen a ball kicked

And viola you have used a scientific method